

Abstract of the Disclosure

A method of fabricating a variable resistance device, wherein the resistance is changed by passing a voltage of various pulse length through the device, includes preparing a silicon substrate; forming a silicon oxide layer on the substrate; depositing a first metal layer on the silicon oxide, wherein the metal of the first metal layer is taken from the group of metals consisting of platinum and iridium; depositing a perovskite metal oxide thin film on the first metal layer; depositing a second metal layer on the perovskite metal oxide, wherein the metal of the second metal layer is taken from the group of metals consisting of platinum and iridium; annealing the structure at a temperature of between about 400°C to 700°C for between about five minutes and three hours; and completing the variable resistance device. A variable resistance R-RAM device includes a silicon substrate having a silicon oxide layer thereon; a first metal layer formed on the silicon oxide layer, wherein the metal of the first metal layer is taken from the group of metals consisting of platinum and iridium; a perovskite metal oxide thin film layer formed on the first metal layer; a second metal layer formed on the perovskite metal oxide, wherein the metal of the second metal layer is taken from the group of metals consisting of platinum and iridium; and metallizing elements to provide a complete device.